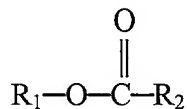


**WHAT IS CLAIMED IS:**

1. A nematicidal composition comprising:

(a) an effective amount of a compound having the formula



wherein:

$\text{R}_1$  = a  $\text{C}_1$ - $\text{C}_5$  substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, and epoxy; and

$\text{R}_2$  = a  $\text{C}_{15}$ - $\text{C}_{19}$  substituted or unsubstituted carbon chain having a *cis* double bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons and either: (i) a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons or (ii) either a single or double bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, cyclopropene, and epoxy; and

(b) an aqueous surfactant.

2. The nematicidal composition of claim 1 wherein  $\text{R}_1$  = a  $\text{C}_1$ - $\text{C}_5$  substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, an unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, and epoxy.

3. The nematicidal composition of claim 1 wherein  $\text{R}_2$  = a  $\text{C}_{15}$ - $\text{C}_{19}$  substituted or unsubstituted carbon chain having a *cis* double bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons and either: (i) a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons or (ii) either a single or double bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, cyclopropene, and epoxy.

4. The nematicidal composition of claim 1 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of one or both of R<sub>1</sub> and R<sub>2</sub> is substituted and the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, and epoxy.

5. The nematicidal composition of claim 1 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of one or both of R<sub>1</sub> and R<sub>2</sub> is substituted and the substituents are selected from the group consisting of: hydroxy, halogen, and amino.

6. The nematicidal composition of claim 1 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of R<sub>1</sub> is singly substituted.

7. The nematicidal composition of claim 1 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of R<sub>2</sub> is singly substituted.

8. The nematicidal composition of claim 1 wherein R<sub>1</sub> = a substituted C<sub>1</sub> methyl.

9. The composition of claim 1 wherein R<sub>1</sub> is a C<sub>1</sub>-C<sub>2</sub> substituted or unsubstituted carbon chain.

10. The composition of claim 1 wherein R<sub>2</sub> is substituted only at one or both of 12<sup>th</sup> and 13<sup>th</sup> carbons.

11. The composition of claim 10 wherein R<sub>2</sub> is substituted only at the 12<sup>th</sup> carbon

12. The composition of claim 10 wherein R<sub>2</sub> is substituted only at the 13<sup>th</sup> carbon.

13. The composition of claim 1 wherein within R<sub>2</sub> there is a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons.

14. The composition of claim 10 wherein within R<sub>2</sub> the substituents are selected from the group consisting of: hydroxy, epoxy, and a C<sub>1</sub> methyl.

15. A nematicidal composition comprising

- 5 (a) a fatty acid methyl ester selected from the group consisting of: ricinoleic acid methyl ester, crepenynic acid methyl ester, and vernolic acid methyl ester; and  
(b) an aqueous surfactant.

10 16. The composition of claim 1 or claim 15 wherein the aqueous surfactant is selected from the group consisting of: ethyl lactate, Tween 20 and Igepal CO 630.

17. The composition of claim 1 or claim 15 wherein the composition further comprises: (c) a permeation enhancer.

15 18. The composition of claim 17 wherein the permeation enhancer is a cyclodextrin.

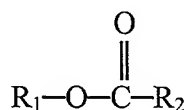
19. The composition of claim 1 where the composition further comprises: (c) a co-solvent.

20. The composition of claim 19 wherein the co-solvent is isopropanol.

21. The composition of claim 1 or claim 15 further comprising a nematicide selected from the group consisting of: avermectins, ivermectin, and milbemycin.

22. A method for control of unwanted nematodes, the method comprising administering to mammals, plants, seeds or soil a nematicidal composition comprising:

(a) an effective amount of a compound having the formula



wherein:

$\text{R}_1$  = a  $\text{C}_1$ - $\text{C}_5$  substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a substituted or unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, and epoxy; and

$\text{R}_2$  = a  $\text{C}_{15}$ - $\text{C}_{19}$  substituted or unsubstituted carbon chain having a *cis* double bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons and either: (i) a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons or (ii) either a single or double bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, cyclopropene, and epoxy; and

(b) an aqueous surfactant.

23. The method of claim 22 wherein  $\text{R}_1$  = a  $\text{C}_1$ - $\text{C}_5$  substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, and epoxy.

24. The method of claim 22 wherein  $\text{R}_2$  = a  $\text{C}_{15}$ - $\text{C}_{19}$  substituted or unsubstituted carbon chain having a *cis* double bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons and either: (i) a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons or (ii) either a single or double bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, cyclopropene, and epoxy.

25. The method of claim 22 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of one or both of R<sub>1</sub> and R<sub>2</sub> is substituted and the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, and epoxy.

5            26. The method of claim 22 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of one or both of R<sub>1</sub> and R<sub>2</sub> is substituted and the substituents are selected from the group consisting of: hydroxy, halogen, and amino.

10           27. The method of claim 22 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of R<sub>1</sub> is singly substituted.

             28. The method of claim 14 wherein the C<sub>1</sub>-C<sub>2</sub> carbon chain of R<sub>2</sub> is singly substituted.

15           29. The method of claim 14 wherein R<sub>1</sub> is a C<sub>1</sub>-C<sub>2</sub> substituted or unsubstituted carbon chain.

             30. The method of claim 14 wherein R<sub>2</sub> is substituted only at one or both of 12<sup>th</sup> and 13<sup>th</sup> carbons.

20           31. The method of claim 14 wherein R<sub>2</sub> is substituted only at the 12<sup>th</sup> carbon.

             32. The method of claim 14 wherein R<sub>2</sub> is substituted only at the 13<sup>th</sup> carbon.

25           33. The method of claim 14 wherein within R<sub>2</sub> there is a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons.

             34. The method of claim 14 wherein within R<sub>2</sub> the substituents are selected from the group consisting of: hydroxy, epoxy, and a C<sub>1</sub> alkyl.

35. A method for control of unwanted nematodes, the method comprising administering to mammals, plants, seeds or soil a nematicidal composition comprising an effective amount of:

- (a) a fatty acid methyl ester selected from the group consisting of: ricinoleic acid methyl ester, crepenynic acid methyl ester, and vernolic acid methyl ester; and
- (b) an aqueous surfactant.

36. The method of claim 22 or claim 35 wherein the aqueous surfactant is selected from the group consisting of: ethyl lactate, Tween 20 and Igepal CO 630.

37. The method of claim 22 or claim 35 wherein the composition further comprises: (c) a permeation enhancer.

38. The method of claim 37 wherein the permeation enhancer is a cyclodextrin.

39. The method of claim 22 or 35 wherein the composition comprises: (c) a co-solvent.

40. The method of claim 39 wherein the co-solvent is isopropanol.

41. The method of claim 22 or claim 35 further comprising administering a nematicide selected from the group consisting of: avermectins, ivermectin, and milbemycin.

42. The method of claim 22 wherein the nematode infects plants and the nematicidal composition is applied to the soil or to plants.

43. The method of claim 42 wherein the nematicidal composition is applied to soil before planting.

44. The method according to claim 42 where the nematicidal composition is applied to soil after planting.

45. The method of claim 42 wherein the nematicidal composition is applied to soil using a drip system.

5 46. The method of claim 42 wherein the nematicidal composition is applied to soil using a drench system.

47. The method of claim 42 wherein the nematicidal composition is applied to plant roots.

10 48. The method of claim 22 wherein the nematicidal composition is applied to seeds.

49. The method of claim 22 wherein the nematode infects a mammal.

15 50. The method of claim 22 wherein the nematicidal composition is administered to non-human mammal.

20 51. The method of claim 22 wherein the nematicidal composition is administered to a human.

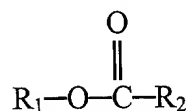
52. The method of claim 50 wherein the nematicidal composition is formulated as a drench to be administered to a non-human animal.

25 53. The method of claim 49 wherein the nematicidal composition is formulated as an orally administered drug.

54. The method of claim 49 wherein the nematicidal composition is formulated as an injectable drug.

55. A nematicidal feed for a non-human mammal comprising:

- (a) a feed;
- (b) an effective amount of a nematicidal compound having the formula



wherein:

$\text{R}_1$  = a  $\text{C}_1$ - $\text{C}_5$  substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, and epoxy; and

$\text{R}_2$  = a  $\text{C}_{15}$ - $\text{C}_{19}$  substituted or unsubstituted carbon chain having a *cis* double bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons and either: (i) a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons or (ii) either a single or double bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a singly or multiply or unsubstituted  $\text{C}_1$ - $\text{C}_2$  carbon chain, cyclopropane, cyclopropene, and epoxy; and

- (c) an aqueous surfactant.

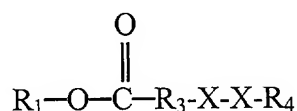
56. The nematicidal feed of claim 55 wherein the feed has been treated to reduce linoleic acid content, linolenic acid content or both.

57. The nematicidal feed of claim 56 wherein both the gamma linolenic acid content and the alpha linolenic acid content have been reduced.

58. The nematicidal feed of claim 55 wherein the feed is selected from the group consisting of: soy, wheat, corn, sorghum, millet, alfalfa, clover, and rye.

59. A nematicidal composition comprising:

- (a) an effective amount of a compound having the formula



wherein:



$R_1$  = a  $C_1$ - $C_5$  substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $C_1$ - $C_2$  carbon chain, cyclopropane, and epoxy;

$R_3$  = a  $C_{11}$  substituted or unsubstituted carbon chain having a *cis* double bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons counting from the carbonyl carbon, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $C_1$ - $C_2$  carbon chain, cyclopropane, cyclopropene, and epoxy;

$R_4$  = a  $C_2$ - $C_6$  substituted or unsubstituted carbon chain wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $C_1$ - $C_2$  carbon chain, cyclopropane, and epoxy;

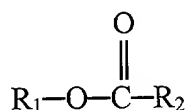
X and Y are independently a substituted or unsubstituted methyl or S, provided at least one of X and Y is S and wherein the substituents on the methyl selected from the group consisting of: halogen, hydrogen, amino, and hydroxy; and

(b) an aqueous surfactant.

60. The nematicidal composition of claim 59 wherein one of X and Y is  $CH_2$ .

61. A nematicidal composition comprising;

(a) an effective amount of a compound having the formula



wherein:

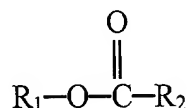
$R_1$  = a  $C_1$ - $C_5$  substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted  $C_1$ - $C_2$  carbon chain, cyclopropane, and epoxy; and

$R_2$  = a  $C_{15}$ - $C_{19}$  substituted or unsubstituted carbon chain having a single bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons and either: (i) a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons or (ii) either a single or double bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino,

cyano, a substituted or unsubstituted C<sub>1</sub>-C<sub>2</sub> carbon chain, cyclopropane, cyclopropene, and epoxy; and (b) an aqueous surfactant.

60. The nematicidal composition of claim 59 wherein one of X and Y is CH<sub>2</sub>.

61. A nematicidal composition comprising;  
(a) an effective amount of a compound having the formula



wherein:

R<sub>1</sub> = a C<sub>1</sub>-C<sub>5</sub> substituted or unsubstituted carbon chain, wherein the substituents are selected from the group consisting of: hydroxy, halogen, amino, cyano, a singly or multiply substituted or unsubstituted C<sub>1</sub>-C<sub>2</sub> carbon chain, cyclopropane, and epoxy; and

R<sub>2</sub> = a C<sub>15</sub>-C<sub>19</sub> substituted or unsubstituted carbon chain having a single bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons counting from the carbonyl carbon and either: (i) a triple bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons or (ii) either a single or double bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a substituted or unsubstituted C<sub>1</sub>-C<sub>2</sub> carbon chain, cyclopropane, cyclopropene, and epoxy; and

(b) an aqueous surfactant.

62. The nematicidal composition of claim 61 wherein R<sub>2</sub> = a C<sub>15</sub>-C<sub>19</sub> substituted or unsubstituted carbon chain having a single bond between the 9<sup>th</sup> and 10<sup>th</sup> carbons and a single bond between the 12<sup>th</sup> and 13<sup>th</sup> carbons and at least one substituent at one or both of the 12<sup>th</sup> and 13<sup>th</sup> carbons, wherein the substituents are selected from the group consisting of hydroxy, halogen, amino, cyano, a singly or multiply or unsubstituted C<sub>1</sub>-C<sub>2</sub> carbon chain, cyclopropane, cyclopropene, and epoxy.

63. The nematicidal composition of claim 62 wherein the 12<sup>th</sup> and 13<sup>th</sup> carbons are substituted with an epoxy group.

5 64. The nematicidal composition of claim 62 wherein the 12<sup>th</sup> carbon is substituted with a hydroxy group.

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